



MILLIKEN & COMPANY

PFAS in Performance Fabrics

Katelyn Goretzke, PE

Milliken™



Environmental Engineer BS, *Clemson University*

Milliken & Company, *Textile Division*

- Licensed PE and “A” level Biological Wastewater Operator in SC
- Experience in process improvement, environmental, and regulatory roles
- Manage the report out on sustainability related improvements for Milliken’s 26 textile plants
- Responsible for coordinating responses to an average of 500 regulatory requests per year

- Fluorochemicals (PFAS) are an active area of legislation and regulation at the federal and state levels.
- Regulatory action varies by jurisdiction, which creates a patchwork of legal requirements.
- Milliken & Co. is proactively eliminating PFAS-containing materials from our textiles by Dec 31, 2022.

According to the United States of America's Environmental Protection Agency (EPA), "PFAS are a group of man-made chemicals that have been manufactured and used by a variety of industries since 1940."

PFAS is a chemical acronym that stands for per- or polyfluoroalkyl substances:

- Per means all
- Poly means many
- Fluoro means fluorine
- Alkyl means carbon with all single bonds
- Substances means chemical

Put it all together, and it means any chemical with a carbon atom bonded to two or more fluorine atoms.



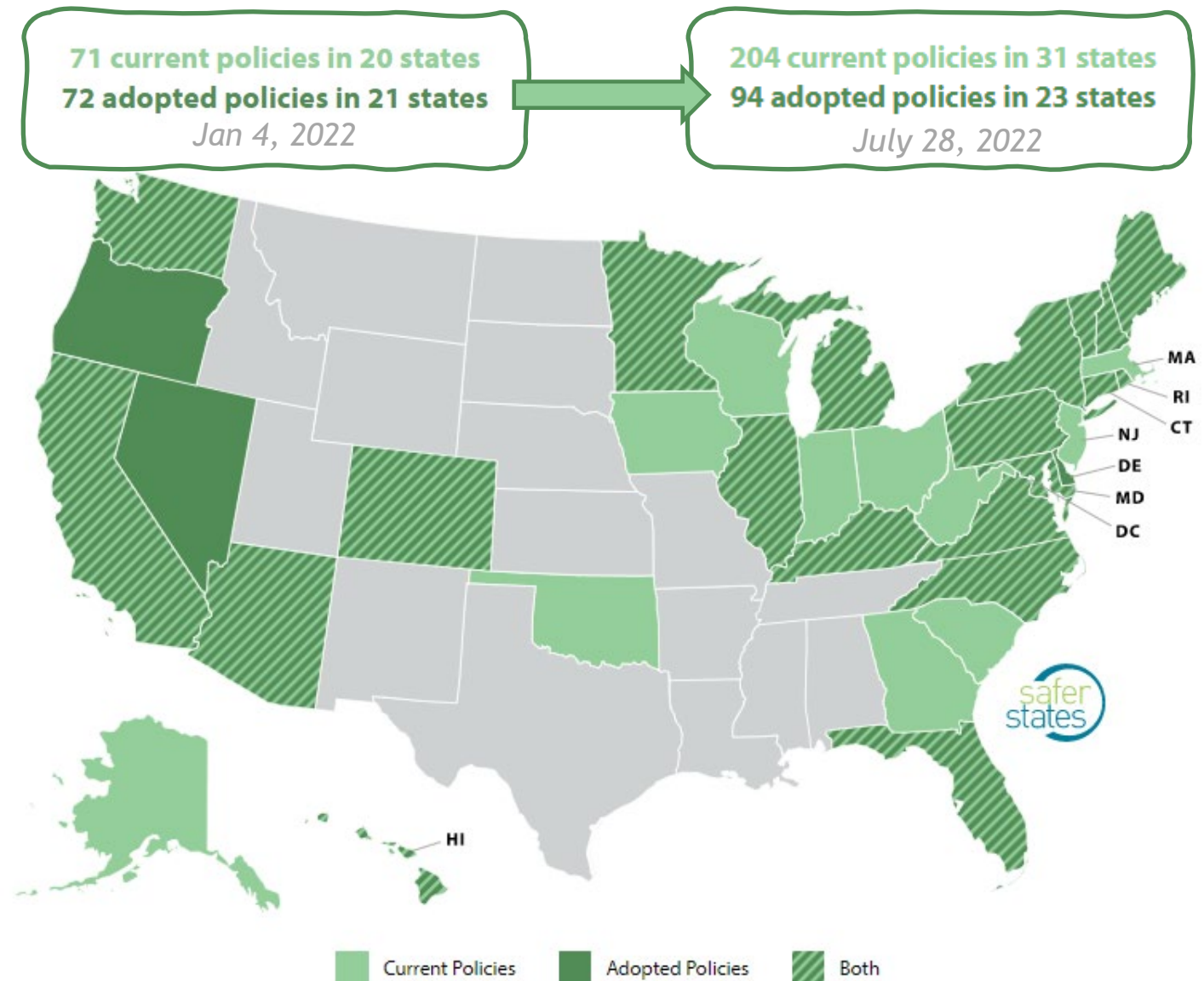
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- "Scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals."

Source: www.epa.gov/pfas/pfas-explained

- The "EPA plans to take specific actions and commits to bolder new policies to safeguard public health, protect the environment, and hold polluters accountable"

Source: www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024



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US 2022 State and Federal Legislation ongoing analysis

| Status count* | State | Federal |
|---|------------|-----------|
| In chamber of origin | 257 | 52 |
| Reconciliation between Assembly/ House and Senate | 2 | 1 |
| Passed Assembly/ House; pending in Senate | 20 | 2 |
| Passed the Senate; pending in the Assembly/ House | 22 | 1 |
| Passed both houses | 12 | 0 |
| Passed in both houses, awaiting governor action | 1 | 0 |
| Vetoed by the Governor | 1 | 0 |
| Bill died; legislature adjourned for the year | 4 | 0 |
| Bill died in committee | 4 | 0 |
| Bill died, refused passage | 0 | 0 |
| Bill died due to state procedural rules | 17 | 0 |
| Bill died | 4 | 0 |
| Passed into law without the Governor's signature | 0 | 0 |
| Passed into law with signature from the Governor | 33 | 0 |
| Total number of proposed bills | 377 | 56 |
| Active/pending | 314 | 56 |
| Delivered to the governor** | 35 | 0 |
| Bill died | 29 | 0 |
| All bills passed | 33 | 0 |

| Top mentioned chemicals | No. of legislations |
|-------------------------|---------------------|
| PFAS | 143 |
| Phenol | 17 |
| Formaldehyde | 16 |
| Mercury | 16 |
| Lead | 14 |
| Toluene | 14 |

| Count of legislations by secto | State | | Federal | |
|-------------------------------------|-------|--------|---------|--------|
| | All | Passed | All | Passed |
| Automotive and aerospace | 5 | 1 | 0 | 0 |
| Built environment | 42 | 2 | 3 | 0 |
| Children's products and toys | 30 | 1 | 0 | 0 |
| Cleaning products | 9 | 0 | 1 | 0 |
| Electronics | 15 | 1 | 2 | 0 |
| Firefighting | 40 | 3 | 3 | 0 |
| Food contact | 53 | 5 | 9 | 0 |
| Medical devices | 8 | 1 | 0 | 0 |
| Personal care products | 63 | 5 | 8 | 0 |
| Retail | 41 | 1 | 0 | 0 |
| Textiles and clothing | 33 | 0 | 2 | 0 |
| Other | 182 | 21 | 36 | 0 |

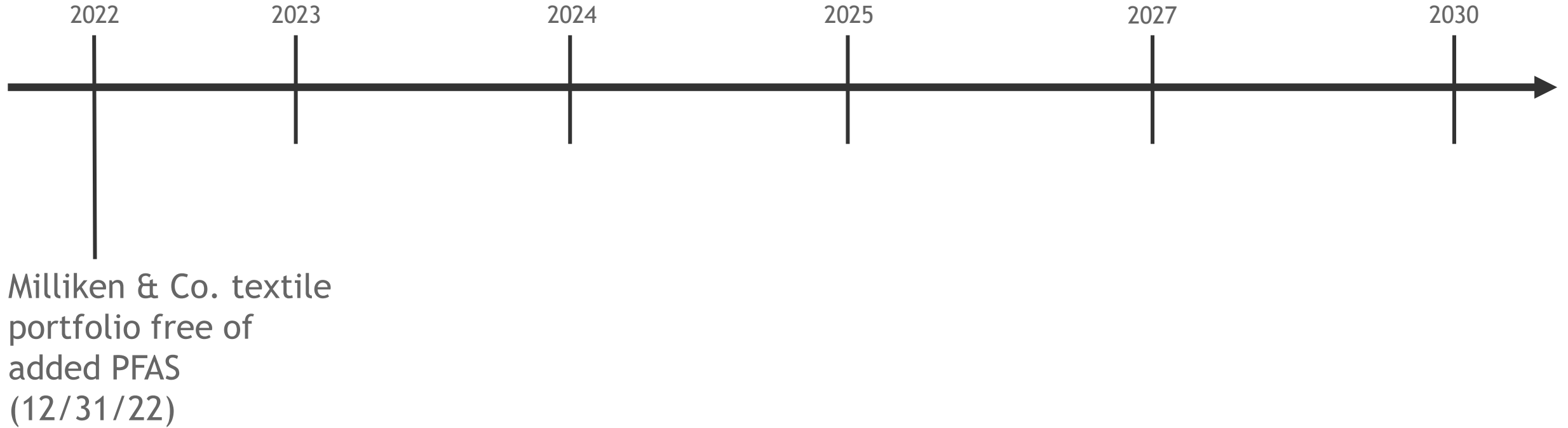
*including those that the governor has vetoed and signed

Federal & State PFAS legislation continues to grow in frequency and scope



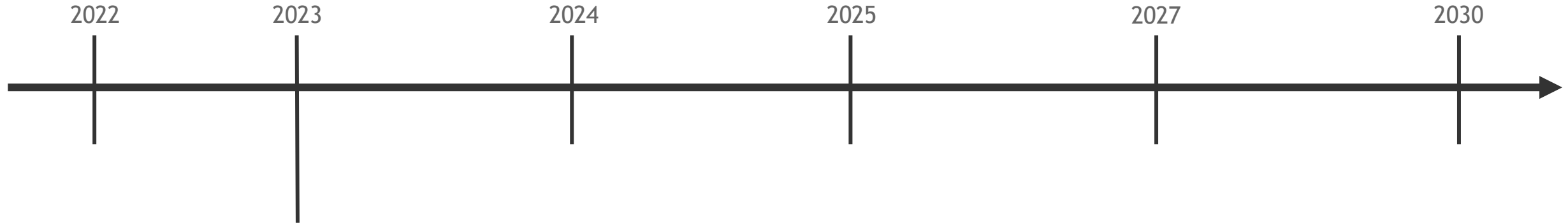
Current state legislation is varied in covered products and effective dates.

**Timeline not to scale*



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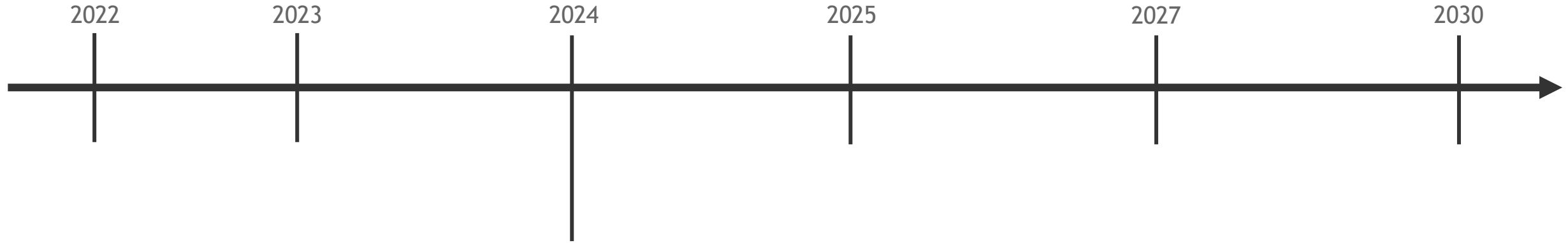
NY - Apparel with added PFAS banned in the state

- Ban covers the sale, distribution, & manufacturing

MA - Fabric treatments and upholstered furniture with intentionally added PFAS over 1 ppm total fluorine banned in the state

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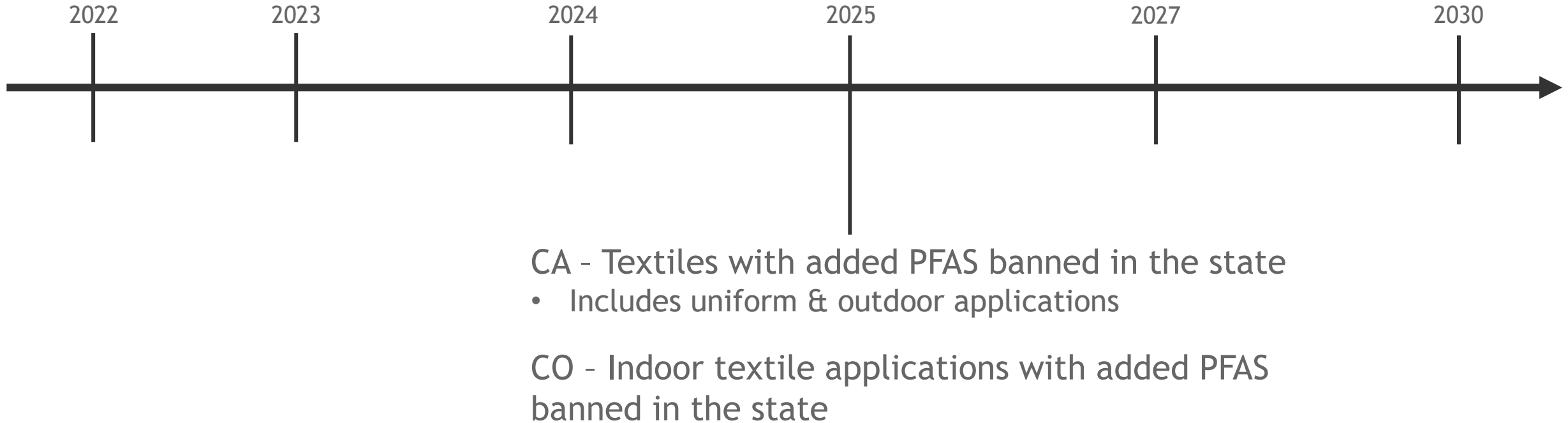
CA - All products with added PFAS must be registered in the state

WA - Priority products with added PFAS will be registered in the state

- Includes firefighting PPE, water repellent apparel, automotive products, etc.

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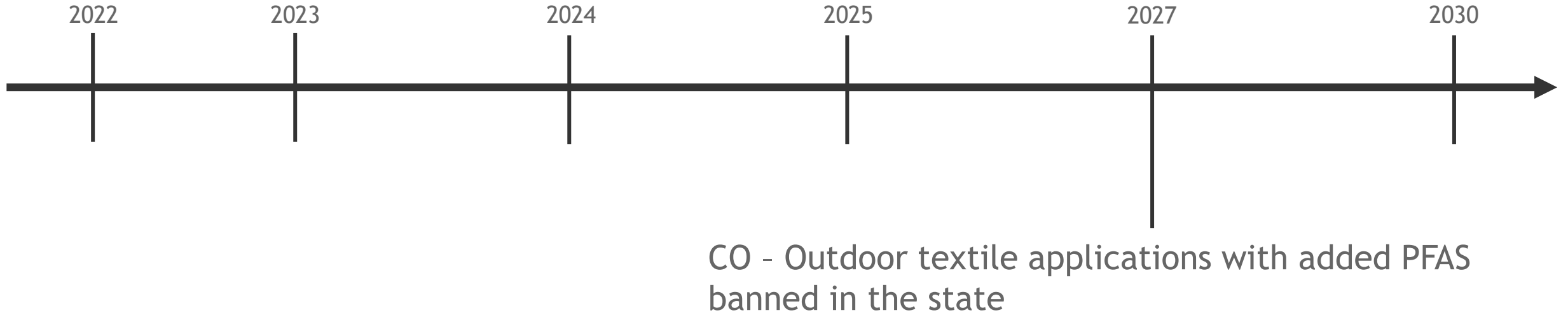


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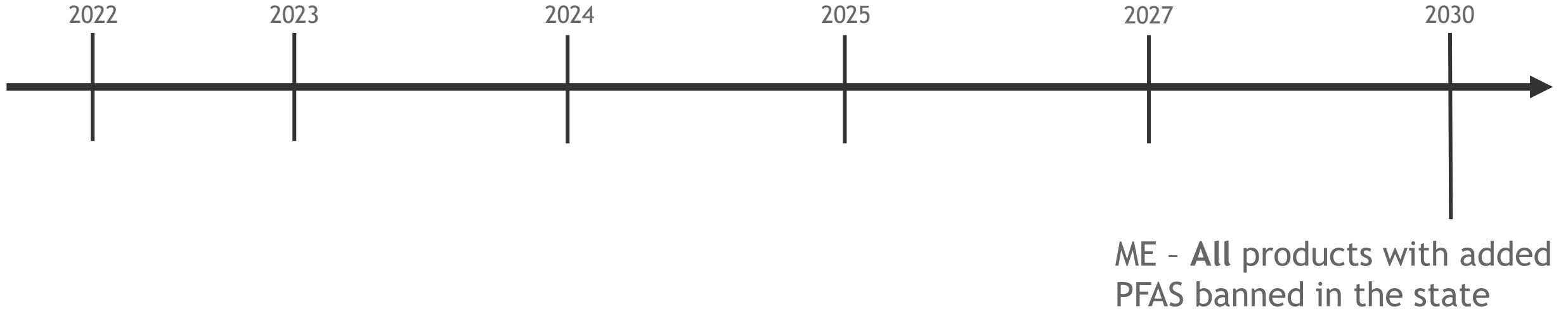


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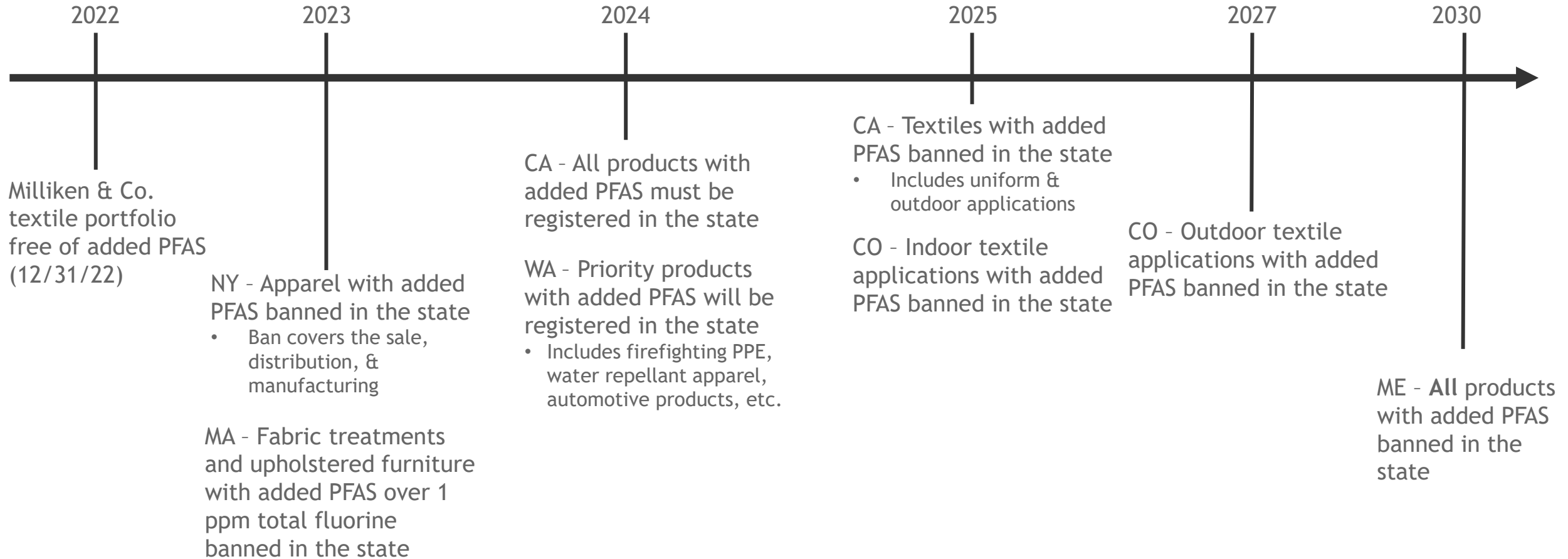


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PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024

RESTRICT

Pursue a comprehensive approach to proactively prevent PFAS from entering air, land, and water at levels that can adversely impact human health and the environment.

Objectives

- Use and harmonize actions under all available statutory authorities to control and prevent PFAS contamination and minimize exposure to PFAS during consumer and industrial uses.
- Place responsibility for limiting exposures and addressing hazards of PFAS on manufacturers, processors, distributors, importers, industrial and other significant users, dischargers, and treatment and disposal facilities.
- Establish voluntary programs to reduce PFAS use and release.
- Prevent or minimize PFAS discharges and emissions in all communities, regardless of income, race, or language barriers.

Source: www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf

Commitment → Action

EPA and other agencies are backing up their words.

November 2021- EPA Issues Request to Textile Manufactures

- Milliken is one of nine textile companies asked to submit extensive information to the EPA
 - Details regarding PFAS use
 - Manufacturing and plant processes
 - Waste-water processes
- Information required to EPA by January 30, 2022

Milliken also received a similar request from the UK under UK-REACH regulations

PFAS testing and reporting added to water permit at Georgia Milliken location in 2022 via state agency. Other states seeking changes to permits.

As materials science experts focused on innovation and sustainability, Milliken & Company has always tried to maintain a product portfolio that is responsive to where the market is going, not just where the market is today.

As part of this effort, we continuously seek feedback from the industry, including our suppliers and customers, and routinely monitor the regulatory landscape. We believe the market for products made with PFAS chemistries is shifting, and as a result, we are in the process of proactively eliminating PFAS-containing materials from our textiles.

We will complete this initiative across the Division by December 31, 2022. We remain committed to engineering high-quality, performance and protective textiles as well as environmental stewardship.

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